

As a second preliminary matter, the Title of the Invention has been amended to correct for a typographical error. Entry of the amended Title is respectfully requested.

As a third preliminary matter, claims 154-161 have been amended to correct for inadvertent typographical errors. No new matter has been added by these amendments.

Claims 150-152 and 162 stand rejected under 35 U.S.C. 102(b) as being anticipated by Koma (U.S. 5,608,556). Claim 152 has been canceled without prejudice, rendering the rejection thereto now moot. With respect to the remaining claims, Applicants respectfully traverse this rejection because the cited reference does not disclose (or suggest) that two separate and distinct domain regulating means are both either protrusions or slits, or that one domain regulating means substantially surrounds the other, different domain regulating means within the display area of *each* pixel, as featured by amended claim 150 of the present invention.

Applicants maintain and incorporate by reference herein those arguments previously advanced on pages 8 through 13 of Amendment B, filed on September 4, 2001. Applicants respectfully request that the Examiner reconsider those arguments, and withdraw the outstanding rejections. Additionally, Applicants respectfully request that the Examiner consider the following new arguments and expansions upon the previous arguments.

Koma discloses a liquid crystal display (“LCD”) device utilizing two substrates on either side of a liquid crystal material. The device requires that an orientation control electrode is disposed on one substrate, with a control window disposed on the substrate

opposite the electrode. Both the electrode and the window are necessary to the operation of the device, and both are the only domain regulating means disclosed or suggested by Koma.

Koma further discloses that the control window must be X-shaped and opposite to each electrode, with only one control window for each pixel/pixel display area. None of these X-shaped domain regulating means shown in any given pixel display area are shown to surround any other domain regulating means within that same pixel.

In contrast, claim 150 of the present invention as amended recites, among other things, that first domain regulating means substantially surround second domain regulating means within the display area of each pixel, where both domain regulating means are either protrusions or slits. Koma does not disclose such a structure.

Although Applicants do not agree with the Examiner in his assertion that the X-shaped control window is at all equivalent to the slits used as domain regulating means in the present invention, even if the Examiner were correct, Koma still does not teach or suggest the present invention. Koma's control window is disclosed to be only one, first domain regulating means. Coupled with this first domain regulating means, Koma still requires that the other, second domain regulating means must be an orientation control electrode. Nowhere does Koma either teach or suggest that the second domain regulating means may be a protrusion or slit. On this basis alone, the present invention cannot be anticipated by Koma.

*no teach protrusion  
Hsraden: b11*

Furthermore, the present invention recites that the first domain regulating means substantially surrounds the *second* domain regulating means, with each of these two domain regulating means recited as separate and distinct elements of the invention. Koma, on the other hand, reveals the control window to be only one domain regulating means. And even though Koma shows a plurality of these control windows surrounding each other on a substrate, this plurality still only represents one disclosed domain regulating means. Thus, even where the Examiner asserts on page 2 of Paper No. 15 that “one X-shaped domain regulating means can be surrounded by other X-shaped domain regulating means in other pixels,” such an interpretation still would not be analogous to the present invention.

Because the control window is only one element of Koma’s device, even by the broadest reading of Koma’s disclosure, the plurality of control windows surrounding other control windows could at most be read as “first domain regulating means substantially surrounding others of said first domain regulating means.” It is a well known principle in the law that a plurality of the same element within a single device cannot be read as two separate and distinctly recited elements within the same device. Koma does not teach a “first control window” and a “second control window.” Koma teaches only a *plurality* of the one control window. The present invention, on the other hand, specifically recites both first *and second* domain regulating means as separate and distinct elements. All recited claim language is to be considered in determining whether *all* of the recited elements read on the

prior art. For at least these additional reasons, the Section 102 rejection is respectfully traversed.

Furthermore, with respect to claims 154-161, the Examiner acknowledged in the October 10, 2001, interview that Koma neither teaches nor suggests that protrusions or slits can be used as both first and second domain regulating means on *opposing* substrates of the same device. Claims 154-161 of the present invention all recite at least a slit or a protrusion as a domain regulating means on one substrate, and at least at slit or protrusion as a second domain regulating means on the opposing substrate. Even the plurality of control windows disclosed by Koma all are disposed on only one of the two substrates. Nowhere does Koma even teach or suggest that the disclosed IPS control window can be disposed on both substrates. Accordingly, for at least these reasons, claims 154-161 are allowable over the prior art of record. It should also here be noted that claims 154-161 were never canceled, nor did these claims depend from original claim 15, which was canceled in the Preliminary Amendment filed October 12, 2000. Accordingly, the Examiner should have already acknowledged that claims 154-161 of the present invention contain allowable subject matter.

Claims 154-161 and 163-170 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Koma. Applicants respectfully traverse this rejection because the cited reference for at least the reasons stated above. Additionally, Koma neither discloses nor suggests protrusions, as used in the present invention, as domain regulating means and, more particularly, as first and second domain regulating means.

The Examiner has again acknowledged that Koma does not specifically teach protrusions, but asserts that protrusions are equivalent to the X-shaped control window taught by Koma. To support this assertion, the Examiner now refers to U.S. Patent No.5,953,093 (“Hirata”) for teaching such a principle. Hirata however, suggests no such equivalency.

Hirata merely teaches that, by use of the rubbing process, long and fine grooves are rubbed into the surface of the substrates. These fine grooves appear as series of bumps and depressions. Rubbing creates both the bumps and depressions of the grooves together, so it would not be proper to assert that Hirata teaches the bumps and depressions to be equivalents, since they are merely two different ways of describing the same rubbed groove. More importantly, use of the rubbing process specifically teaches away from the present invention.

One of the significant advantages realized by the present invention is the elimination of the need for the rubbing process. Because Hirata requires rubbing for the creation of the grooves, Hirata cannot be properly applied to the present invention to show equivalence between the protrusions and slits of the present invention. Accordingly, the Section 103 rejection of claims 154-161 and 163-170 based on Koma (and Hirata by reference) is respectfully traversed.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached Appendix is captioned **“Version with Markings to Show Changes Made.”**

For all of the foregoing reasons, Applicants submit that this Application, including claims 150-151 and 154-170, is in condition for allowance, which is respectfully requested. The Examiner is invited to contact the undersigned attorney if an interview would expedite prosecution.

Respectfully submitted,

GREER, BURNS & CRAIN, LTD.

By 

Josh C. Snider  
Registration No. 47,954

**Customer No. 24978**

April 4, 2002

300 S. Wacker Drive  
Suite 2500  
Chicago, Illinois 60606-6501  
Telephone: (312) 360-0080  
Facsimile: (312) 360-9315

F:\DATA\WP60\2803\64683\AMDC.WPD



**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE TITLE:**

Please amend the Title as follows:

--VERTICALLY-ALIGNED (VA) LIQUID CRYSTAL DISPLAY DEVICE--.

**IN THE CLAIMS:**

Please amend claims 150 and 154-161 as follows:

- 1                   150. (Twice Amended) A liquid crystal display device comprising:  
2                   a first substrate and a second substrate for sandwiching a liquid crystal having  
3                   a negative dielectric constant anisotropy; and  
4                   first and second domain regulating means for regulating azimuths of  
5                   orientations of said liquid crystal when a voltage is applied to said liquid crystal,  
6                   wherein when vertically seen to the substrates, said first and second domain  
7                   regulating means are arranged on said substrates so that said first domain regulating means

8 substantially surrounds said second domain regulating means in [the] a display [areas] area  
9 of [the pixels] each pixel, and

10 wherein said first and second domain regulating means consist of protrusions  
11 provided on said substrates or slits provided at electrodes on said substrates.

1 154. (Twice Amended) A liquid crystal display device according to claim  
2 [153] 150, wherein said first domain regulating means consists of protrusions provided on  
3 said first substrate, and said second domain regulating means consists of protrusions  
4 provided on said second substrate.

1 155. (Twice Amended) A liquid crystal display device according to claim  
2 [153] 150, wherein said first domain regulating means consists of protrusions provided on  
3 said first and second substrate, and said second domain regulating means consists of  
4 protrusions provided on said second substrate.

1 156. (Twice Amended) A liquid crystal display device according to claim  
2 [153] 150, wherein said first domain regulating means consists of slits provided on said first  
3 substrate, and said second domain regulating means consists of slits provided on said second  
4 substrate.



1                   157. (Twice Amended) A liquid crystal display device according to claim  
2 [153] 150, wherein said first domain regulating means consists of slits provided on said first  
3 and second substrates, and said second domain regulating means consists of slits provided  
4 on said second substrate.

1                   158. (Twice Amended) A liquid crystal display device according to claim  
2 [153] 150, wherein said first domain regulating means consists of protrusions provided on  
3 said first substrate, and said second domain regulating means consists of slits provided on  
4 said second substrate.

1                   159. (Twice Amended) A liquid crystal display device according to claim  
2 [153] 150, wherein said first domain regulating means consists of protrusions provided on  
3 said first substrate and slits provided on said second substrate, and said second domain  
4 regulating means consists of slits provided on said second substrates.

1                   160. (Twice Amended) A liquid crystal display device according to claim  
2 [153] 150, wherein said first domain regulating means consists of slits provided on said first  
3 substrate, and said second domain regulating means consists of protrusions provided on said  
4 second substrate.

1                   161. (Twice Amended) A liquid crystal display device according to claim  
2 [153] 150, wherein said first domain regulating means [if consisted] consists of slits provided  
3 on said first substrate and protrusions provided on said second substrate, and said second  
4 domain regulating means consists of protrusions provided on said second substrate.